

## HIGHLIGHTS

- Heavy rainfall accompanied by flash floods in the first half of May with reductions in the latter half reported across the whole country
- Temperatures observed to be on the increase across the whole country thereby igniting a spike in the spread of animal and human diseases
- Based on the weather forecast, floods are not expected during the period 1- 15 June while temperatures are forecasted to continue rising
- A few swarms of locusts from the interior of Saudi Arabia began moving south towards northern Yemen and will likely begin breeding in the interior of the country particularly in the summer breeding areas.

## I. METEOROLOGICAL REVIEW

In May 2021, heavy rainfall exceeding 70 mm was reported in Al Mahwit (Almahweet, 167.8 mm), Ibb (Ibb, 132.1 mm), Rimah (Al Jabeen-Rimah, 110.5 mm), Taizz (Al Maafer, 98.6 mm), and Al Dhale'e (Al Dhala, 93.7 mm) governorates (Fig. 1A and B). Several other governorates experienced torrential rains that breached the 40 mm threshold considered to be a trigger point for flash floods in most low-land areas thus, causing wide-spread flash flooding across most regions particularly in the southern and western wadies and parts of Aden, Hadramaut, Hajjah, Lahj, Abyan, Dhamar, Marib and Al Bayda governorates, critically affecting an estimated 3,730 households<sup>1</sup> and causing 13 casualties among them, children. On May 2 2021, heavy rainfall was reported in the historical city of Tarim (Hadramaut governorate) reaching a flash flood trigger point of 40 mm within 4 hours (19:00 to 23:00 hours) consequently, causing irreparable damage to agricultural lands and destroying 200 houses. An assessment of rainfall anomalies (difference from long term average, 1983-2013) showed spatial patterns consistent with the observed flash floods with the whole country generally experiencing normal to above normal rainfall (Fig. 2A).

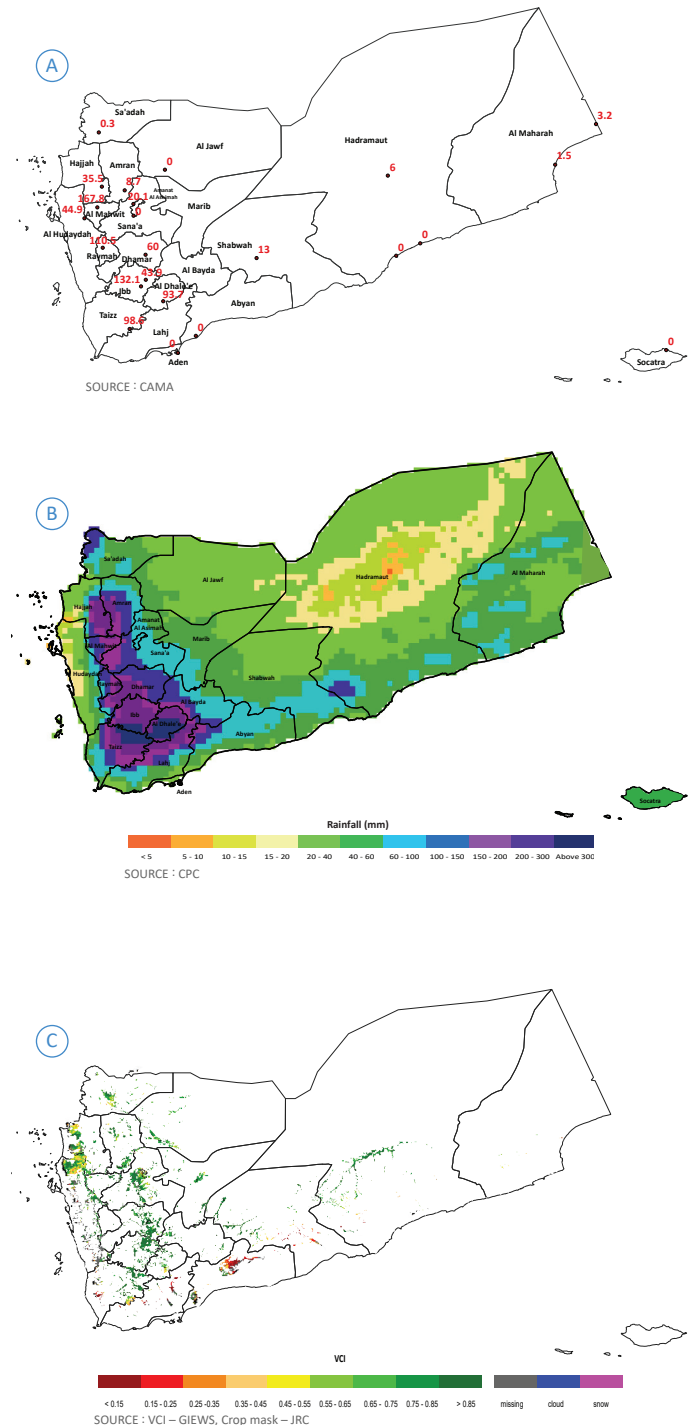
At the short-term scale (every 10 days), the progress of rainfall mimicked the monthly spatial distribution (Fig. 1A and B) with wetter occurrences over the western half of the country while the eastern half remained relatively dry (Fig. 3A – C). Further, the onset of the month (Fig. 3A) was characterised by wet weather conditions driven by moisture cascading from April, although it was notable that by the middle of the month (Fig. 3B), rainfall started reducing with further reductions being observed towards the end (Fig. 3C). Similarly, the progress of vegetation conditions (Fig. 4A – C) was generally good as depicted by the monthly dataset (Fig. 1C) and anomalies (Fig. 2B). Overall, no major changes were observed in vegetation conditions from the beginning to the end of the month. What stands out, however, is that the beginning (Fig. 4A) and the middle (Fig. 4B) of the month were characterised by more cloudy conditions over parts of the Arabian Sea Coast, Red Sea Coast and Tihama plain than the end (Fig. 4C) consistent with rainfall patterns (Fig. 3A – C).

Agricultural production activities in May were characterised by a transition from land preparation and the planting of cereal crops to thinning and weeding, therefore, with germination being widespread, satellite imagery captured crops and the Agricultural Stress Index (ASI) which is used as an indicator of likelihood of drought conditions across cropped areas showed no water stress although most areas still showed that they had no crops or were offseason throughout May (Fig. 6A – C). This is however expected to rapidly change as the season progresses.

Temperature increments were reported throughout May reaching as high as 40°C across coastal areas (34.0°C in the Highlands; Fig. 5A and Table 1). The rise in temperature was accompanied by waves of dust especially across desert and coastal regions extending to the Central and Northern Highlands and negatively impacting human and animal health (See Section II). Field weather stations reported the highest temperature in Hadramaut (Seiyoun, 42.0°C) which was higher than the average (35.1°C) by 19.6 percent and roughly similar to the previous month's (41.0°C) reported in Al Mahara (Algaidha, 41.0°C). Other meteorological stations that recorded maximum temperatures above 40°C include Al Hudaydah (Al Kaden, 41.3°C), Shabwah (Ataq, 40.4°C), and Al Jawf (Al Jouf, 40.2°C). Regarding minimum temperatures, with only Dhamar (8.6°C) recording below 10°C, a general increase was observed (Fig. 5B and Table 1).

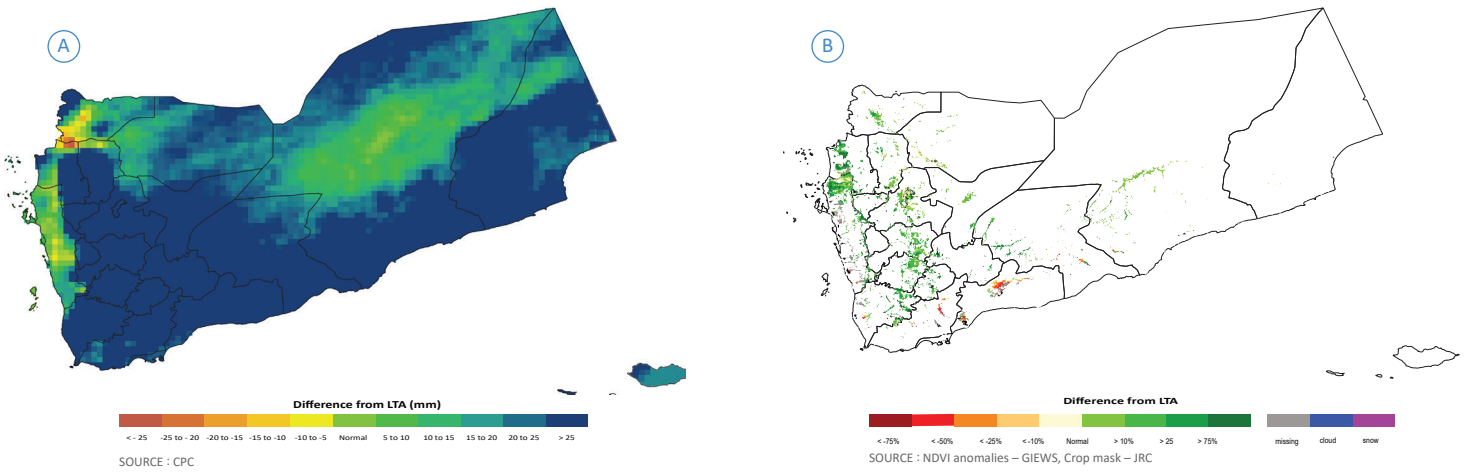
The weather outlook up to the mid of June indicates further decrease in rainfall with all regions generally expected to receive below 40 mm (Fig. 7) thus, suggesting that there is currently no potential flood threat up to mid-June. High temperatures, especially over the eastern half of the country and near desert areas are forecasted to dominate the first half of June. Farmers and the general public are, therefore, advised to avoid exposure to high temperature and dusty environments especially for people with respiratory and chest conditions.

Fig. 1: Progress of monthly rainfall and vegetation conditions A) Observed rainfall (mm) B) Satellite-based rainfall estimates (mm) C) Vegetation Condition Index.

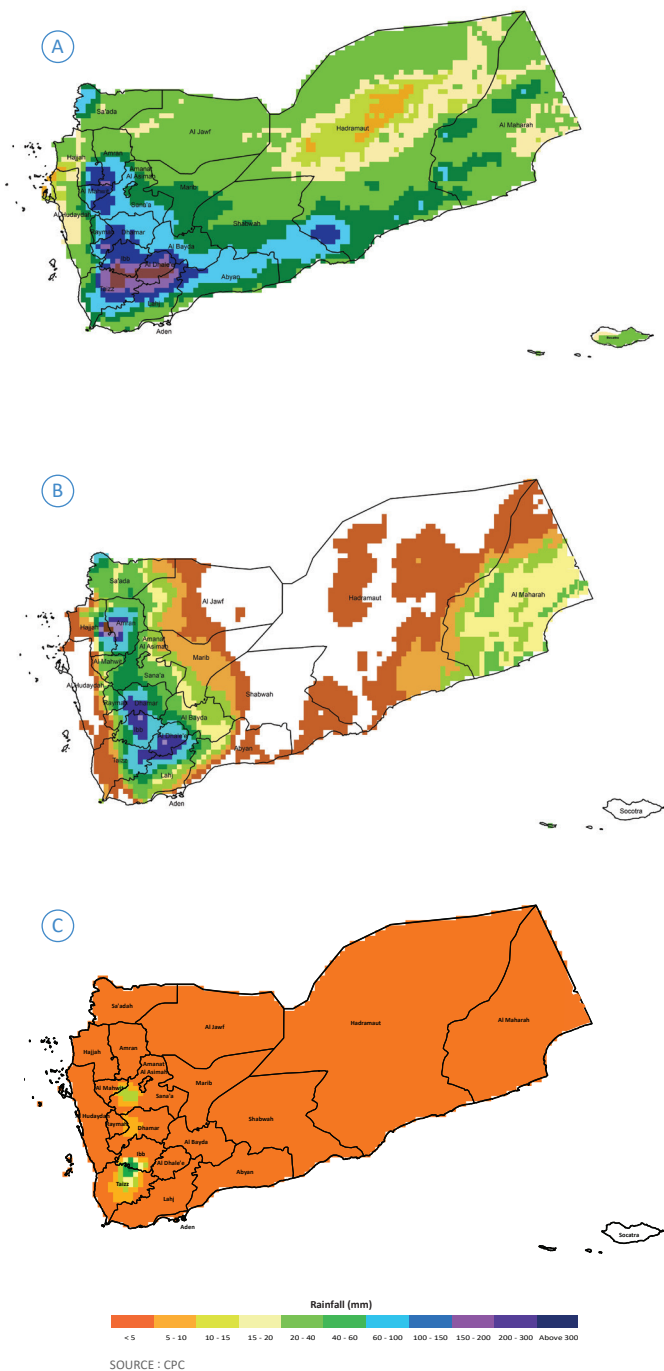


<sup>1</sup> <https://reliefweb.int/report/yemen/yemen-flash-update-2-humanitarian-impact-flooding-11-may-2021-enar>

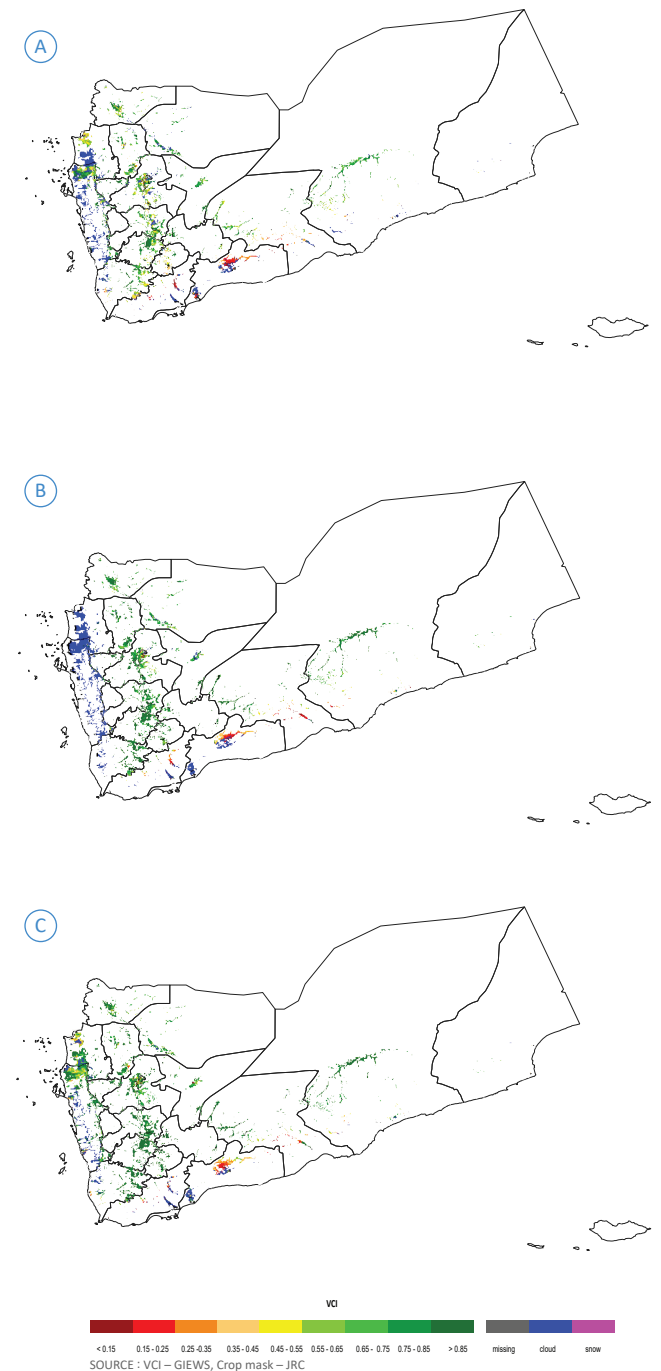
**Fig. 2:** Monthly anomalies (difference from long term average, LTA) for A) rainfall (LTA: 1983 – 2013) B) Normalized Difference Vegetation Index (LTA: 1984- 2015)



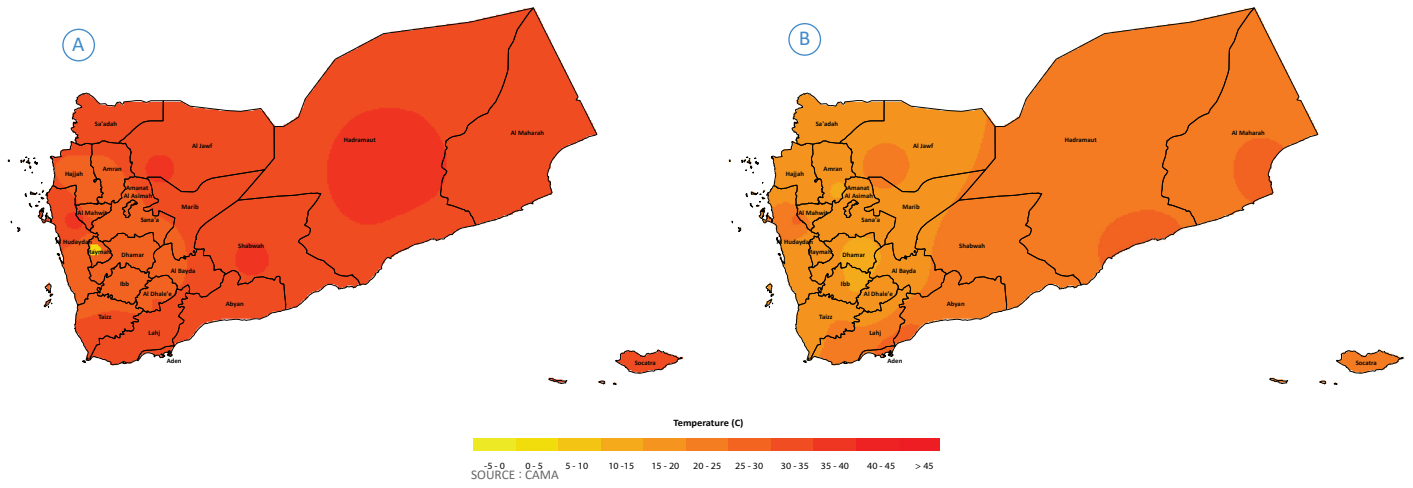
**Fig. 3:** Progress of rainfall estimates A) 1 to 10 May B) 11 to 20 May C) 21 to 31 May



**Fig. 4:** Progress of vegetation conditions for A) 1 to 10 May B) 11 to 20 May C) 21 to 31 May



**Fig. 5:** Progress of monthly temperature conditions for A) Maximum B) Minimum



**Fig. 6:** Progress of Agricultural Stress Index (ASI) for A) 1 to 10 May B) 11 to 20 May C) 21 to 31 May



## II. IMPACT ON AGRICULTURE

Climatic conditions in May were found to be dominated by very hot temperatures thus, had negative impacts on agricultural activities. Specifically, the Ministry of Agriculture and Irrigation (MAI) observed an increase in animal and plant diseases with livestock such as sheep, goats and poultry dying because of prolonged exposure to high temperatures especially on the plateaus and near desert areas. The observed increase in temperature coupled with intense rainfall and high humidity also caused a proliferation of malaria-carrying mosquitoes which resulted in a general increase in malarial cases thus threatening the work of some farmers. With high temperatures, an increase in the transmission rates of dengue fever was also reported.

In the Central, Northern and Southern Highlands, the planting period of cereal crops is generally over, and most agricultural activities were centred on thinning, weeding, and irrigation of vegetables using groundwater resources. In the Tihama coastal areas, planting of summer sorghum and the harvesting of fruits (mango and banana) has continued while in the Central and Northern Highlands harvesting of peaches, strawberries, and apricot fruits has started.

The Desert Locust (DL) situation in May remained generally calm across summer breeding areas located in Al-Jawf, Marib, Shabwah and Hadramout Governorates. The Desert Locust Monitoring and Control Center (DLMCC) indicates that towards the end of May, some swarms from the interior of Saudi Arabia began moving south towards northern Yemen and will likely begin breeding in the interior of the country particularly in the summer breeding areas. Further, given the current and forecasted weather conditions, there is a high likelihood of small-scale breeding of locusts especially across areas with recent rainfall activities. Areas identified to be especially at risk of locust breeding include Hadhramaut (Thamud), Shabwah (Ataq), and Marib governorates<sup>2</sup>.

**Outlook for June** indicates that swarms arriving from Saudi Arabia will potentially intensify locust presence in Yemen and this calls for increased ground surveys and operations that seek to control or ameliorate the negative impact of DL on agriculture and vegetation. Given the forecasted high temperatures, farmers are advised to irrigate their crops early in the mornings or late in the evenings to avoid damage. Further, farmers are strongly advised to avoid exposing livestock to heat stress and dusty winds by keeping them in shades and paying attention to ventilation and nutrition. High temperatures coupled with a reduction in rainfall are also expected to critically affect rain-fed areas across which cereal crops, a measure of food security, are mostly grown. Contingency plans in preparation of food insecurity are therefore strongly advised.

<sup>2</sup> <http://www.fao.org/ag/locusts/common/ecg/1914/en/DL512e.pdf>

Fig. 7: Forecast for 1 – 15 June 2021

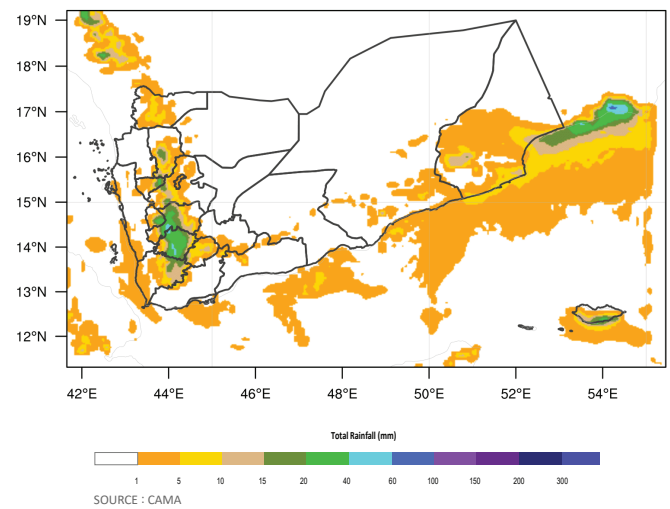
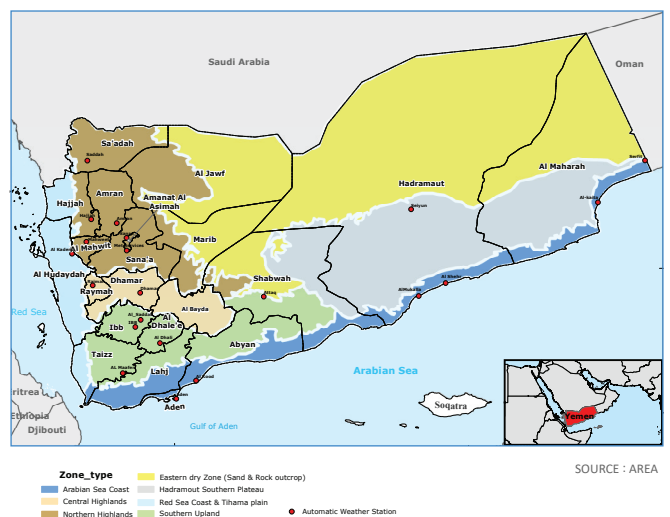


Fig. 8: Agro-ecological zones and location of observatory stations



## Sources:

- Primary data are sourced from the Civil Aviation and Meteorology Authority (CAMA), Ministry of Agriculture and Irrigation (MAI) and FAO Global Information Early Warning System (GIEWS).
- Vegetation indicators are sourced from FAO GIEWS and are based on 10-day (dekadal) vegetation data from the METOP-AVHRR sensor at 1 km resolution (2007 and after). Data at 1 km resolution for the period 1984-2006 are derived from the NOAA-AVHRR dataset at 16 km resolution. <http://www.fao.org/giews/earthobservation/country/index.jsp?lang=en&code=YEM#> and from the European Union's anomaly hotspots of agricultural production (ASAP)
- Rainfall estimates (RFE2) are sourced from the Climate Prediction Centre (CPC) of The National Oceanic and Atmospheric Administration (NOAA)

### Technical Partners

#### Food Security and Early Warning Information System Programme

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### Resource Partner



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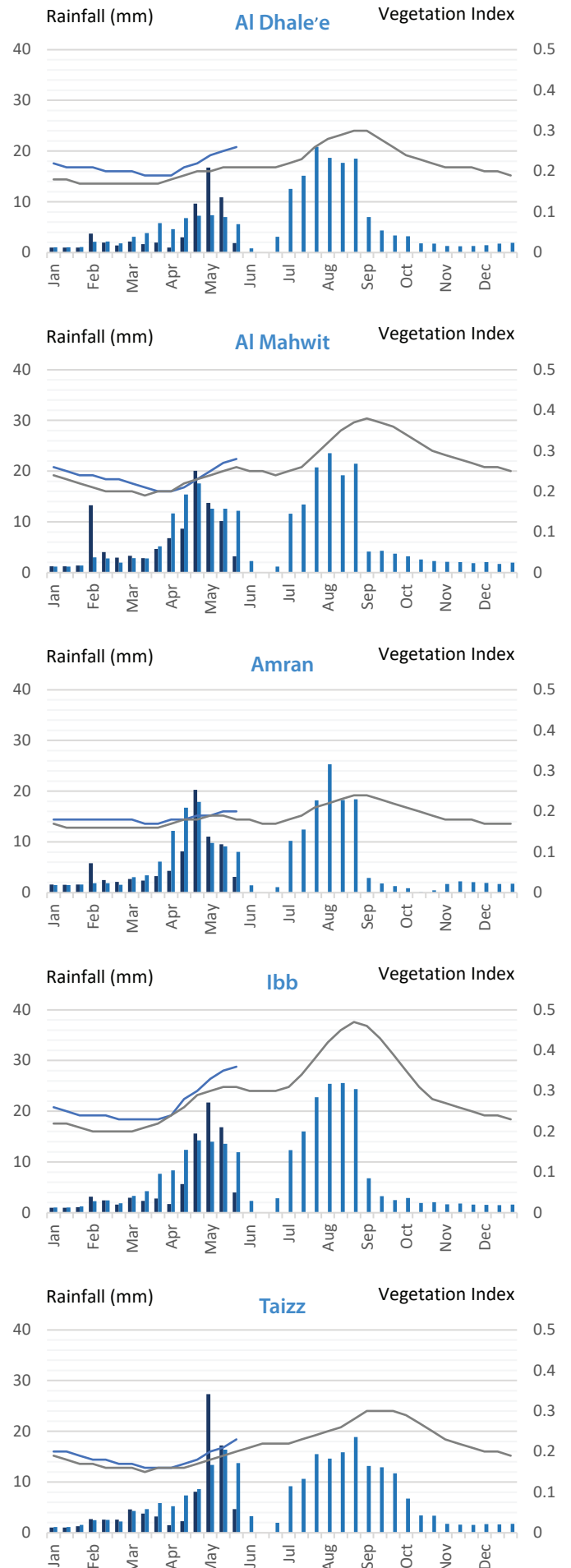
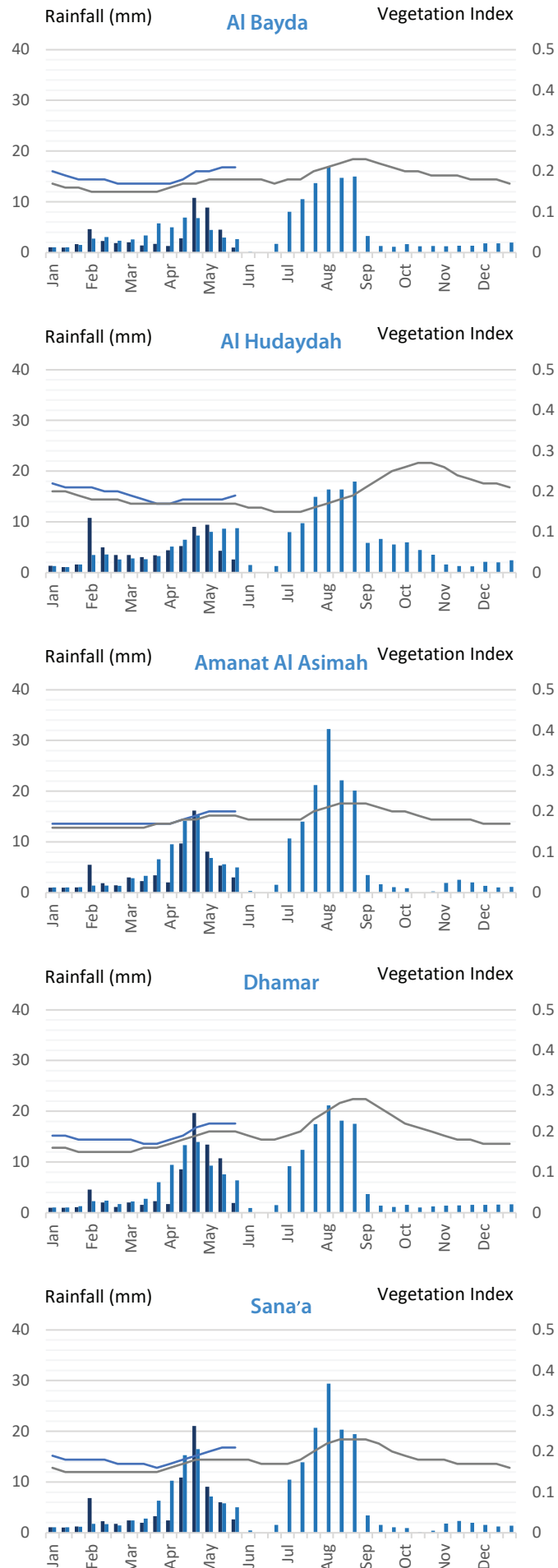
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### III. VARIATIONS OF RAINFALL AND NDVI



**Table 1: Observed Station Data: Rainfall and Temperature**

Governorate	Station	Rainfall (mm)	Temperature (°C)	
		Monthly	Max	Min
Aden	Aden	0.0	38.5	26.7
Al Dhale'e	Al Dhala	93.7	34.9	16.1
Raymah	Al Jabeen-Rimah	110.5	28.6	11.5
Al Hudaydah	Al Kaden	44.9	41.5	21.9
Abyan	Al Kood	0.0	37.9	23.5
Taizz	Al Maafer	98.6	35.9	17.2
Hadramaut	Al Mukalla	0.0	-	-
Hadramaut	Al Shafer	0.0	35.1	26.1
Al Maharah	Algaidha	1.5	39.0	23.5
Al Mahwit	Almahweet	167.8	29.4	11.0
Al Jawf	Al Jouf	0.0	40.2	19.5
Ibb	Alsaddah	43.9	28.5	11.5
Amran	Amran	8.7	32.0	10.0
Shabwah	Ataq	13.0	40.4	17.8
Dhamar	Dhamar	60.0	30.0	8.6
Hajjah	Hajjah	35.5	31.0	11.4
Ibb	Ibb	132.1	32.2	11.5
Sa'ada	Sadah	0.3	33.5	14.0
Sana'a	Sana'a	20.1	32.0	11.4
Hadramaut	Seiyoun	6.0	42.0	19.1
Al Maharah	Serfeet	3.2	37.9	19.6
Socotra	Socatra	0.0	38.0	22.6
Amanat Al Asimah	CAMA/YMC Office	0.0	-	-
Amran	Hamdah	0.0	30.0	12.0
Amran	Qa'a Alboon	7.8	31.0	11.0
Amran	Amran Gov.	8.7	31.0	13.0
Dhamar	AREA-HQ	-	-	-
Ibb	Ibb (MAI)	80.0	32.0	12.0
Amran	Eial Sourih	0.0	-	-
Dhamar	Rosabh	35.6	-	-
Dhamar	Dhamar (MAI)	66.0	-	-
Amanat Al Asimah	Al-Asbahi	35.6	-	-
Amanat Al Asimah	Aljamaah	22.0	31.0	12.0
Sana'a	Al Erah	21.1	31.0	11.0
Amanat Al Asimah	Alhasba	30.0	-	-
Dhamar	Maqar-Alhya'a	47.3	30.0	11.0
Hadramaut	Assom	2.4	-	-
Hadramaut	Tarim	40.0	-	-
Hadramaut	Sah	15.0	-	-
Hadramaut	Aliotoof	7.2	-	-
Hadramaut	Seyun Pr	1.8	-	-
Hadramaut	Seyun Re	1.4	-	-
Hadramaut	Hawrah	20.0	-	-
Hadramaut	Doaan	23.4	-	-
Hadramaut	Shibam	5.2	-	-
Hadramaut	Ard Makhharsh	11.5	-	-
Hadramaut	Brom	4.4	-	-
Dhamar	Qa'a Shrah	15.2	29.0	13.0
Amanat Al Asimah	Baghdad	32.0	-	-
Sana'a	Sanhan	31.2	-	-
Amanat Al Asimah	Shamlan	21.3	-	-
Amanat Al Asimah	Sawan	27.1	-	-